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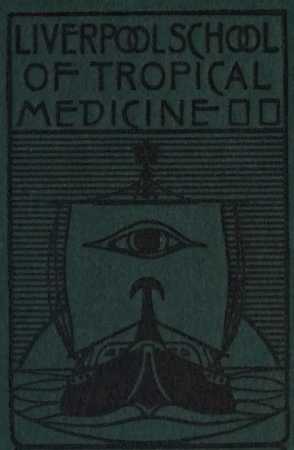

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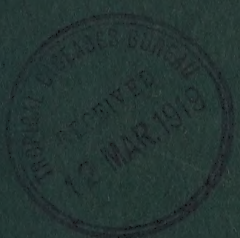

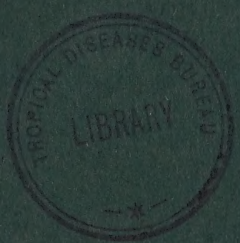

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STUDIES IN THE TREATMENT OF MALARIA

XVI.—INTRAVENOUS INJECTIONS OF NOVARSENOBILLON IN SIMPLE TERTIAN MALARIA

BY

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Undertaken at the request of the War Office

(*Received for publication July* 12, 1918)

In each of the following series a single injection only of novarsenobillon was given. The results are summarized in the tables, which also contain the following additional information:—Place of infection, and interval in months between present treatment and (*a*) first admission to a hospital for malaria, (*b*) leaving infected area, (*c*) arrival in England.

0·45 GRAMME SERIES (Cases 850-869)

A single injection of 0·45 gramme of novarsenobillon* was given in twenty cases. Blood examinations were made daily in all the cases. Parasites disappeared from the blood in one to two

*Novarsenobillon (Novarsenobenzol Billon) is the dioxydiaminoarsenobenzene mono-methylene sulphoxylate of soda, the salt described by Ehrlich under the title of '914.'

days. The temperature fell to normal either on the day of the injection or in one to three days.

Relapses. In seventeen of the twenty cases a parasitic relapse occurred in eleven to twenty-seven days, average eighteen days. In three cases (853*, 858 and 869) there was no relapse within an observation period of sixty days. In the seventeen cases which relapsed parasitically, febrile relapses occurred in fifteen to thirty days, average twenty days. In one case (858) which did not relapse parasitically there were numerous non-parasitic febrile attacks after treatment.

0·6 GRAMME SERIES (Cases 870-892)

A single injection of 0·6 gramme of novarsenobillon was given in twenty-three cases. Blood examinations were made daily in all the cases. Parasites disappeared from the blood in one to two days. The temperature fell to normal either on the day of the injection or in one to two days.

Relapses. In twenty-two of the twenty-three cases a parasitic relapse occurred in ten to forty-six days, average twenty days. In the remaining case (884), there was no relapse within an observation period of one hundred and eight days. In twenty-one of the twenty-two cases, which relapsed parasitically, febrile relapses occurred in fourteen to fifty-seven days, average twenty-four days. In the remaining case (883) quinine was given on the twenty-fifth day. In one case (884) which did not relapse parasitically there was a low irregular temperature throughout; a diagnosis of liver abscess was made on the physical signs, but no pus was found at operation.

0·9 GRAMME SERIES (Cases 893-913)

A single injection of 0·9 gramme of novarsenobillon was given in twenty-one cases. Blood examinations were made daily in all the cases. Parasites disappeared from the blood in one day in twenty cases, in two days in the remaining case. The temperature fell to normal either on the day of the injection or in one to two days.

---

*This case relapsed in 105 days.

TABLE I

Summary of results of a single intravenous injection of novarsenobillon grm. 0·45, in simple tertian malaria.

*E.A. = East Africa. S. = Salonika.

Number of case	*Place of infection	Interval (in months) between first admission to a hospital with malaria and present treatment	Interval (in months) between leaving infected area and present treatment	Interval (in months) between arrival in England and present treatment	Date of end of treatment	Temperature fell to normal in — days after injection	Parasites disappeared from cutaneous blood in — days after injection	Parasitic relapse occurred in — days after injection	Febrile relapse (above 100° F.) occurred in — days after injection	Observation period in days in cases which did not relapse	Remarks
850	...	...	...	...	13.11.17	1	2	16	20	...	
851	...	...	...	...	16.11.17	1	2	28	29	...	
852	...	...	...	...	16.11.17	1	2	12	15	...	
853	...	...	...	...	19.11.17	1	1	...	...	90*	99° F. on 50th; 103° F. on 56th; 99° F. on 89th days
854	...	...	...	...	19.11.17	3	2	13	15	...	
855	...	...	...	...	26.11.17	1	2	25	24	...	
856	...	...	...	...	17.12.17	1	1	20	23	...	
857	...	...	...	...	17.12.17	Same day	1	18	21	...	
858	E.A.	12	10	5	19.12.17	Same day	1	...	...	67	
859	...	...	...	...	19.12.17	1	2	23	25	...	
860	...	...	...	...	19.12.17	Same day	1	27	30	...	
861	...	...	...	...	4.1.18	Same day	2	18	19	...	
862	E.A.	6	...	...	7.1.18	Same day	2	15	16	...	
863	...	...	...	...	17.1.18	1	1	22	23	...	
864	S.	14	...	...	4.2.18	1	1	18	18	...	
865	S.	7	...	...	4.2.18	Same day	1	11	15	...	
866	...	...	...	...	4.2.18	Same day	1	14	16	...	
867	S.	18	3	3	27.4.18	1	1	13	13	...	
868	S.	10	3	2	2.5.18	Same day	1	16	16	...	
869	...	...	...	...	3.5.18	Same day	1	...	...	60	

*This case relapsed parasitically in 105 days.

TABLE II.

Summary of results of a single intravenous injection of novarsenobillon grm. 0·6, in simple tertian malaria.

* E.A. = East Africa. F. = France. S. = Salonika.

Number of case	*Place of infection	Interval (in months) between first admission to a hospital with malaria and present treatment	Interval (in months) between leaving infected area and present treatment	Interval (in months) between arrival in England and present treatment	Date of end of treatment	Temperature fell to normal in — days after injection	Parasites disappeared from cutaneous blood in — days after injection	Parasitic relapse occurred in — days after injection	Febrile relapse (above 100° F.) occurred in — days after injection	Observation period in days in cases which did not relapse	Remarks
870	F.	6	...	...	11.2.18	Same day	1	27	29	...	
871	E.A.	17	...	...	15.2.18	Same day	1	21	21	...	
872	S.	22	2	1	15.2.18	Apyrexia	2	46	50	...	
873	S.	16	...	...	25.2.18	2	2	16	18	...	100° F. on 6th and 8th days after injection.
874	E.A.	12	3	2	25.2.18	Same day	1	34	57	...	Gamete on 34th day; trophozoite on 35th day; then negative till 56th day.
875	...	...	...	...	2.3.18	Same day	1	24	24	...	
876	...	...	...	...	2.3.18	1	2	14	17	...	
877	...	...	...	...	5.3.18	1	2	23	24	...	
878	S.	21	3	2	6.3.18	1	1	19	19	...	
879	...	...	...	...	14.3.18	Same day	1	15	17	...	
880	S.	18	...	...	14.3.18	1	1	17	22	...	
881	S.	18	2	1	16.3.18	2	2	12	14	...	
882	...	...	...	...	16.3.18	Same day	1	10	15	...	
883	...	...	...	...	25.3.18	1	1	25	...	...	Quinine orally on 25th day.
884	...	...	...	...	25.3.18	...	1	...	...	108	Low irregular temperature throughout.
885	S.	20	2	1	25.3.18	Same day	2	16	23	...	
886	S.	9	1	1	27.3.18	1	1	15	18	...	
887	S.	9	...	...	27.3.18	Same day	1	13	18	...	
888	S.	18	2	1	28.3.18	Same day	1	16	18	...	
889	S.	16	...	...	28.3.18	Same day	2	13	17	...	
890	S.	21	2	1	28.3.18	Same day	1	18	20	...	
891	S.	19	...	...	28.3.18	Apyrexia	1	19	23	...	
892	S.	10	3	2	18.5.18	Same day	2	40	40	...	

TABLE III.

Summary of results of a single intravenous injection of novarsenobillon grm. 0·9 in simple tertian malaria.

*E.A. = East Africa. It. = Italy. S. = Salonika.

mber of ase	*Place of infection	Interval (in months) between first admission to a hospital with malaria and present treatment	Interval (in months) between leaving infected area and present treatment	Interval (in months) between arrival in England and present treatment	Date of end of treatment	Temperature fell to normal in — days after injection	Parasites disappeared from cutaneous blood in — days after injection	Parasitic relapse occurred in — days after injection	Febrile relapse (above 100° F.) occurred in — days after injection	Observation period in days in cases which did not relapse	Remarks
893	S.	19	3	2	27.4.18	Same day	1	15	15	...	
894	It.	8	1	1	28.4.18	1	1	17	17	...	
895	S.	19	3	2	28.4.18	1	1	17	18	...	
896	S.	6	3	2	28.4.18	2	1	17	18	...	
897	E.A.	8	2	1	30.4.18	Same day	1	21	24	...	
898	S.	8	2	1	30.4.18	Same day	1	15	18	...	
899	S.	8	4	1	30.4.18	Same day	1	14	15	...	
900	S.	8	3	2	30.4.18	Same day	1	21	23	...	
901	S.	7	2	2	30.4.18	1	1	21	22	...	
902	S.	12	4	3	1.5.18	1	1	...	...	37	Quinine orally on 37th day.
903	E.A.	7	5	2	1.5.18	1	1	19	21	...	
904	S.	26	3	3	1.5.18	Same day	2	17	20	...	
905	S.	13	3	2	1.5.18	1	1	...	...	60*	
906	S.	9	4	3	2.5.18	1	1	16	19	...	
907	S.	21	3	2	2.5.18	Apyrexia	1	14	19	...	
908	S.	8	2	2	2.5.18	Same day	1	16	17	...	
909	E.A.	10	4	2	2.5.18	Same day	1	47	48	...	
910	S.	9	5	2	3.5.18	1	1	15	16	...	
911	S.	12	3	2	3.5.18	Apyrexia	1	31	30	...	
912	S.	14	3	2	3.5.18	Same day	1	5	14	...	Gametes very scanty on 5th day; trophozoites on 16th day.
913	S.	8	7	6	18.5.18	1	1	24	26	...	

*This case relapsed parasitically in 63 days.

Relapses. In nineteen of the twenty-one cases a parasitic relapse occurred in five to forty-seven days, average nineteen days. In one case (902) there was no relapse within an observation period of thirty-seven days, when quinine was administered by mistake. In the remaining case (905*) there was no relapse within an observation period of sixty days. In eighteen of the nineteen cases which relapsed parasitically, febrile relapses occurred in fourteen to forty-eight days, average twenty-one days.

CONCLUSION

Single intravenous injections of novarsenobillon in doses varying from 0·45 to 0·9 gramme control the febrile paroxysms and cause the disappearance of parasites from the cutaneous blood, as a rule within one day, in simple tertian malaria. Parasitic relapses occur, on an average, in twenty-one days. The curative effect of a single injection of the drug in the doses used is practically nil.

* This case relapsed in 63 days.

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